

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-7. (Canceled).

8. (Previously presented) A system for etching a wafer, the system being capable of determining an endpoint of a plasma etching operation of a surface on a wafer, the surface of the wafer having features being etched, comprising:

a broad spectrum light source generating light within a range of wavelengths;

5 a lens system having an optical fiber aperture for receiving optical fibers;

a light source optical fiber bundle configured to transmit the light from the light source to the optical fiber aperture of the lens system, the lens system being configured to collimate light exiting the light source optical fiber bundle and project the light onto a spot on the surface of the wafer;

10 a spectrometer;

a detection fiber bundle comprising a plurality of detector fibers, the detection fiber bundle transmitting reflected light received by the lens system to the spectrometer, the reflected light being reflected from the surface of the wafer, the plurality of detector fibers being interleaved with fibers from the light source optical fiber bundle at the optical fiber
15 aperture of the lens system, the plurality of detector fibers thereby receiving light reflected from the surface of the wafer back through the lens system, each detector fiber corresponding with a discrete detection region, each detection region generating a specific optical signal across a frequency band, whereby the endpoint of the plasma etching operation is determinable from one or more of the specific optical signals.

9-18. (Canceled)

19. (Previously presented) A plasma processing system for use in semiconductor manufacturing, comprising:

a plasma processing chamber having an interior region, an exterior, and a viewport providing visual access to the interior region from the exterior;

5 a light source;

a lens system having an optical fiber aperture for receiving optical fibers;

a light source optical fiber bundle configured to transmit light from the light source to the optical fiber aperture of the lens system, the lens system being configured to collimate the light as it exits the light source optical fiber bundle and project the light onto a spot on the surface of the wafer;

10 a spectrometer;

a detection fiber bundle comprising a plurality of detector fibers, the detection fiber bundle transmitting reflected light received by the lens system to the spectrometer, the reflected light being reflected from the surface of the wafer, the plurality of detector fibers being interleaved with fibers from the light source optical fiber bundle at the optical fiber aperture of the lens system, the detector fibers thereby receiving the reflected light after passing back through the lens system; and

wherein the spectrometer is configured to analyze the reflected light from each of the plurality of detector optical fibers and identify an endpoint of plasma processing based on the analysis of the reflected light received by each of the plurality of detector optical fibers, wherein the analysis of the reflected light from each of the plurality of detector optical fibers includes matching the received optical signal from each of the plurality of detector optical fibers to a model optical signal for a desired endpoint to plasma processing.

20. (Canceled).

21. (Previously presented) The plasma processing system of claim 19, wherein the spectrometer includes a CCD detector array that provides a plot of at least one analyzed received optical signal from a corresponding one of the plurality detector optical fibers.

22. (Original) The plasma processing system of claim 19, wherein the plasma processing chamber is a plasma etch chamber.

23. (Original) The plasma processing system of claim 19, wherein the plasma processing chamber is a plasma deposition chamber.